REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-91 are pending. None of the Claims, specification, or drawings are amended by way of the present Reply.

In the outstanding Office Action, Claims 1-3, 8, 13, 49, and 60 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sonehara (U.S. Patent No. 6,388,697) in view of Ubhayakar (U.S. Patent No. 4,953,961) and Shimada (U.S. Patent No. 4,760,251); Claims 37-39 and 81 were rejected under 35 U.S.C. § 103(a) over Ubhayakar in view of Schoon (U.S. Patent No. 4,586,057) and Shimada; Claim 44 was rejected under 35 U.S.C. § 103(a) as unpatentable over Ubhayakar in view of Schoon, Shimada, and Sonehara; Claims 4, 5, 10, 40, and 41 were rejected under 35 U.S.C. §103(a) as unpatentable over Sonehara in view of Ubhayakar; Claims 9 and 45 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Plesko (U.S. Patent No. 5,596,442); Claims 6, 7, 11, 18, 30, 43, and 48 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Konno (U.S. Patent No. 5,767,955).

The Office Action further asserts at page 11, that "Regarding claims 25 and 71, arguments analogous to those presented for claims 1 and 4 are applicable to claim 25." However, as noted in M.P.E.P. § 2106(II)(C), "when evaluating the scope of a claim, every limitation in the claim must be considered." By making sweeping statements that the combination of independent Claim 1 with dependent Claim 4 is analogous to either of independent Claims 25 or 71, the Final Action fails to properly evaluate the scope of these claims. In particular, Claim 1 recites "an optical scanning module" whereas Claim 71 recites

"an optical scanning device" that includes "a plurality of optical scanning modules arranged so that primary scanning directions thereof coincide with each other." The comparison of Claim 1 to Claim 25 is also deficient. Claim 1 recites "a frequency of pixel information supplied to said light-emission source varies in accordance with a primary scanning position of each pixel" and Claim 4 recites that the "movable mirror driving part varies an amplitude of said movable mirror so that a predetermined detection signal value may be obtained in said detection part," whereas Claim 25 recites "a variable frequency setting part varying, in accordance with an amplitude of said movable mirror, a frequency causing said light-emission source to emit light based on pixel information." Nevertheless, in the interest of advancing prosecution in this case, Claims 25 and 71 are treated as having been rejected under the same grounds as independent Claim 1: under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Shimada.

The rejection of Claims 1-3, 8, 13, 25, 49, 60, and 71 under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Shimada is traversed.

Independent Claims 1, 13, and 25 each recite an optical scanning module that includes, *inter alia*:

> a light-emission source configured to emit a light beam;
> a movable mirror configured to reflect the light beam, the movable mirror being *swingably supported by a rotary shaft*; and
> a movable mirror driving part that is configured to cause said movable mirror to *oscillate in first and second opposite directions*... (Emphasis added.)

Independent Claims 49, 60 and 71 each recite an optical scanning device that includes a plurality of optical scanning modules arranged so that primary scanning directions thereof

coincide with each other. Independent Claims 49, 60 and 71 each further recite that the optical scanning modules each include, *inter alia*:

> a light-emission source configured to emit a light beam;
> a movable mirror configured to reflect the light beam, the movable mirror being *swingably supported by a rotary shaft*; and
> a movable mirror driving part that is configured to cause said movable mirror to *oscillate in first and second opposite directions*...(Emphasis added.)

The outstanding Office Action fails to make a *prima facie* case of obviousness because (1) the outstanding Office Action lacks a clear articulation as to why the claimed movable mirror that is *swingably supported by a rotary shaft* would have been obvious, and (2) the proposed modification of Sonehara would change the principle of operation of the Sonehara device.

M.P.E.P. § 2142 notes that "The Federal Circuit has stated that 'rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.' *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)." None of the cited references, either alone or in combination, disclose or suggest the claimed movable mirror that is *swingably supported by a rotary shaft*, and the outstanding Office Action fails to provide any reasoning as to why the inclusion of this structure would be obvious.

Turning to the applied references, Sonehara relates to a two-dimensional optical scanning device. Figure 4 of Sonehara illustrates a two-dimensional optical scanner that includes synchronous detector 402, a photodetector 401, and a control circuit 403.[1] Sonehara

[1] See Sonehara, at col. 6, lines 41-45.

describes that scanning signals are transmitted to a linear movable mirror driving unit 404 in synchronization with two synchronous signals 409 from detectors 401 and 402.[2] A light valve is disposed on a plane 416 to be scanned by a beam from a moving mirror 415.[3] Figure 4 of Sonehara further illustrates a pre-objective scanning optical system in which a rotating polygon-mirror deflector 412 is positioned on the side of a light source with respect to the condensing lens group 411.[4] However, Sonehara fails to disclose or suggest a movable mirror that is *swingably supported by a rotary shaft.* Instead, Sonehara describes that the movable mirror 305 is a *linear* movable mirror. Indeed, Sonehara describes that the "means for moving the linear movable mirror in this embodiment involves the use of a servo motor 309 including a highly accurate *cross roller table and a ball screw* joined thereto."[5] A *linear* movable mirror that is moved by a *cross roller table and a ball screw* is not a movable mirror that is *swingably supported by a rotary shaft.*

The outstanding Office Action acknowledges that "Sonehara does not explicitly disclose that the movable mirror is swingably supported by a rotary shaft,"[6] but applies Ubhayakar, stating that "Ubhayakar introduces an apparatus illustrated in fig. 1 that includes mirrir [sic] 5, which is movably mounted and supported by positioning device 7 as represented by coupling (shaft) 9 (fig. 1, col. 3 lines 31-39)."[7] However, the outstanding Office Action's characterization of Ubhayakar is factually inaccurate.

Figure 1 of Ubhayakar is a *block diagram* that illustrates an apparatus that includes a top mirror 1, which is fixed in position by a support 3, and a bottom mirror 5, which is

[2] See Sonehara, at col. 6, lines 48-50.
[3] See Sonehara, at col. 6, lines 54-56.
[4] See Sonehara, at col. 6, lines 58-61.
[5] See Sonehara, at col. 6, lines 20-23.
[6] See the outstanding Office Action at the paragraph spanning pages 3-4.
[7] See the outstanding Office Action at page 4, lines 3-5.

moveably mounted.[8] Ubhayakar describes that a "positioning device 7 underlies and supports lower mirror 5 as represented by the coupling line 9."[9] However, the coupling line 9 is not a "shaft," as asserted in the Office Action, but is instead a block diagram representation of the relationship between the positioning device 7 and the mirror 5. Ubhayakar describes with reference to Figures 5a and 5b of Ubhayakar that the positioner 7 can be a stack of disk shaped wafers 14 and 16 that are separated by and bonded to a triad of barium titanate piezo electromechanical transducers 15, 17 and 19, each of which serves as an actuator.[10] Ubhayakar also describes with reference to Figure 8 that the bottom mirror can be positioned by a magnetic levitation device, in which a mirror 5" is included on a base of magnetic material, such as iron, and is made to "float" through control of magnetic flux provided by electromagnetic coils 41 and 43.[11] However, neither a mirror that is supported by a stack of wafers nor a mirror that floats through control of magnetic flux is a movable mirror that is *swingably supported by a rotary shaft.*

Shimada fails to cure the deficiencies in Sonehara and Ubhayakar. Shimada relates to an optical scanning apparatus. Figure 3 of Shimada illustrates an optical scanning apparatus in which a light beam L is deflected at a constant angular velocity by a rotating polygonal mirror 32, and converged by a condenser lens 34 onto the surface of a photoconductive photosensitive body 30.[12] However, Shimada does not disclose or suggest that the polygonal mirror 32 is *swingably supported by a rotary shaft.* Thus, even the combined teachings of

[8] See Ubhayakar, at col. 3, lines 31-35.
[9] See Ubhayakar, at col. 3, lines 35-36.
[10] See Ubhayakar, at col. 5, lines 13-29.
[11] See Ubhayakar, at col. 6, lines 36-51.
[12] See Shimada, at col. 1, lines 40-45.

Sonehara, Ubhayakar, and Shimada fail to disclose a mirror that is *swingably supported by a rotary shaft*.

Moreover, M.P.E.P. § 2143.01(VI) states that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)." In the present case, the outstanding Office Action proposes to modify the Sonehara device based on the teachings of Ubhayakar. However, such a combination would require a substantial reconstruction and redesign of the elements shown in Sonehara as well as a change in the basic principle under which the Sonehara construction was designed to operate. Such a combination is improper and fails to support a *prima facie* case of obviousness.

As discussed above, Sonehara describes that scanning signals are transmitted to a *linear movable* mirror driving unit 404 in synchronization with two synchronous signals 409 from detectors 401 and 402.[13] By contrast, Ubhayakar describes azimuthal beam positioning and angle multiplication in a system that utilizes top mirror 1, which is fixed in position by a support 3, and a bottom mirror 5, which is moveably mounted. The *angular* positioning devices 7 described in Ubhayakar use a difference principal of operation than the *linear* movable mirror that is moved by a *cross roller table and a ball screw* described in Sonehara. Thus, it would require a substantial reconstruction and redesign of the elements shown in Sonehara as well as a change in the basic principle under which the Sonehara construction was designed to operate in order to incorporate the azimuthal beam positioning and angle

[13] See Sonehara, at col. 6, lines 48-50.

multiplication system of Ubhayakar. Thus, the combined teachings of Sonehara and Ubhayakar are not sufficient to render Claims 1, 13, 25, 49, 60, or 71 *prima facie* obvious.

Accordingly, even the combined teachings of Sonehara, Ubhayakar, and Shimada fails to disclose or suggest all of the features of independent Claims 1, 13, 25, 49, 60, or 71. It is submitted that independent Claims 1, 13, 25, 49, 60, or 71, and the claims depending therefrom, are in condition for allowance.

The rejection of Claims 37-39 and 81 were rejected under 35 U.S.C. § 103(a) over Ubhayakar in view of Schoon and Shimada is traversed.

Independent Claim 37 recites an optical scanning module that includes, *inter alia*:

> a light-emission source configured to emit a light beam;
> a movable mirror configured to reflect the light beam, the movable mirror being *swingably supported by a rotary shaft*; and
> a movable mirror driving part that is configured to cause said movable mirror to *oscillate in first and second opposite directions*... (Emphasis added.)

Independent Claim 81 recites an optical scanning device that includes a plurality of optical scanning modules arranged so that primary scanning directions thereof coincide with each other. Independent Claim 81 further recites that the optical scanning modules each include, *inter alia*:

> a light-emission source configured to emit a light beam;
> a movable mirror configured to reflect the light beam, the movable mirror being *swingably supported by a rotary shaft*; and
> a movable mirror driving part that is configured to cause said movable mirror to *oscillate in first and second opposite directions*. (Emphasis added.)

As discussed above, neither Ubhayakar nor Shimada disclose or suggest the claimed movable mirror that is *swingably supported by a rotary shaft*. Schoon fails to cure the deficiency in Ubhayakar and Shimada.

Figures 1 and 2 of Schoon illustrate a portion of a laser printer in which light from a laser 1 is focused by a lens system 2 onto the mirror 3 of a resonant scanner which oscillates to direct the light to a mirror 4 causing the light to move as a scan lengthwise of mirror 4.[14] However, Schoon fails to disclose or suggest that the mirror 3 is *swingably supported by a rotary shaft*, as recited in Claims 37 and 81.

Accordingly, even the combined teachings of Ubhayakar, Schoon and Shimada fails to disclose or suggest all of the features of independent Claims 37 or 81. It is submitted that independent Claims 37 and 81, and the claims depending therefrom, are in condition for allowance.

With respect to the rejection of Claim 44 under 35 U.S.C. § 103(a) as unpatentable over Ubhayakar in view of Schoon, Shimada, and Sonehara, as discussed above, Sonehara fails to cure the deficiencies in the combination of Ubhayakar, Shimada, and Schoon discussed above with respect to independent Claim 37. Accordingly, Claim 44 is believed to be in condition for allowance for at least the same reasons as Claim 37, from which it depends.

With respect to the rejection of Claims 4, 5, 10, 40, and 41 under 35 U.S.C. §103(a) as unpatentable over Sonehara in view of Ubhayakar, as discussed in detail above, the proposed combination of Sonehara with Ubhayakar changes the principle of operation of Sonehara device. Therefore, the combined teachings of Sonehara and Ubhayakar are not sufficient to render Claims 4, 5, 10, 40, and 41 *prima facie* obvious.

[14] See Schoon, at col. 2, lines 39-66.

With respect to the rejection of Claims 9 and 45 under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Plesko, Plesko fails to cure the deficiencies in the combination of Sonehara and Ubhayakar discussed above with respect to independent Claims 1 or 37. Accordingly, Claims 9 and 45 are believed to be in condition for allowance for at least the same reasons as Claims 1 and 37, from which they respectively depend.

With respect to the rejection of Claims 6, 7, 11, 18, 30, 43, and 48 under 35 U.S.C. § 103(a) as unpatentable over Sonehara in view of Ubhayakar and Konno, Konno fails to cure the deficiencies in the combination of Sonehara and Ubhayakar discussed above with respect to independent Claims 1, 13, 25, or 37. Accordingly, Claims 6, 7, 11, 18, 30, 43, and 48 are believed to be in condition for allowance for at least the same reasons as Claims 1, 13, 25, or 37, from which they respectively depend.

Should the Examiner continue to disagree with the above distinctions, Applicant respectfully requests that the Examiner provide an explanation via Advisory Action pursuant to M.P.E.P. § 714.13 specifically rebutting the points raised herein for purposes of facilitating the Appeal process.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance for Claims 1-91 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, he or she is encouraged to contact Applicant's undersigned representative by the below listed telephone number.

Respectfully submitted,

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